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**DERMAPECIA: HAIR LOSS, SCALP DISEASE AND DANDRUFF DETECTION
SYSTEM**

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Abstract

One of the key parts of a human face is head and hair. Hair makes a face shine out more and any problems on the scalp and baldness can cause Anxiety and stress. Anxiety and stress are one of the causes of balding and other scalp problems which in turn is a vicious cycle. Being able to find out if people have these scalp diseases and if they are balding at the comfort of their own home is important. It can begin at any stage in life and can affect teens as well as adults. Although many Male Pattern Baldness is discussed highly, Female Pattern Baldness is not as highly discussed although it is also predominant.

To tackle this problem, an image processing system using convolutional neural networks (CNNs) for image classification. By preprocessing images and enhancing feature extraction a model is trained to check for different scalp diseases such as alopecia areata, dandruff. Different architectures and different methodologies will also be attempted to see the benefits of each in aspect to these detections. A minimum of 3 types of models were tested for each of those different detection types.

The proposed VGG-16 transfer learning model shows an accuracy of 70% for the detection of 3 stages of baldness. The dataset was curated to include female patients as well. This model outperformed both the ResNet50 and the MobileNetV2 models. The Alopecia detection model that performed best was a MobileNetV2 model providing an accuracy of 81%. This outperformed the ResNet-50 and VGG-16 models by quite a big margin. The Hair Styles detection system was also trained in one of those 3 models and MobileNetV2 was what performed the best, having an accuracy of 88%. The final model, the scalp diseases model, also showed the best accuracy of 91% on the MobileNetV2 model.

Keywords: Alopecia Areata, Seborrheic Dermatitis, Deep Learning, Convolutional Neural Networks

Subject Descriptors:

- Computer Methodologies -> Artificial Intelligence -> Computer Vision -> Computer Vision Problems -> Image Segmentation
- Applied Computing -> Life and medical sciences -> Consumer Health